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|---|--|------------|-----------|
| <b>Title of the module</b>              | <b>Functional genomics of marine eukaryotes</b>  |            |           |
| <b>Term/semester</b>                    | Summer term / 2  |            |           |
| <b>VAK-Number</b>                       | Will be assigned centrally   |            |           |
| <b>Credit points</b>                    | 6 ECTS   |            |           |
| <b>Compulsory/ elective course</b>      | Elective course  |            |           |
| <b>Teaching methods</b>                 | <b>Method</b>  | <b>SWS</b> | <b>CP</b> |
|   | Lecture  | 1.3 (18h)  | 1.5       |
|   | Seminar  | 1.0 (14h)  | 1.2       |
|   | Lab course   | 3.8 (55h)  | 3.3       |
| <b>Self study</b>                       | protocols  | 20 h       |           |
|   | preparation of the talk  | 23 h       |           |
|   | learning for the exam  | 50 h       |           |
| <b>Module representative</b>            | Dr. U. John  |            |           |
| <b>Instructor</b>                       | Dr. U. John (Molecular ecology and functional genomics), Prof. Frickenhaus (Bioinformatic)   |            |           |
| <b>Examiner</b>                         | Dr. U. John  |            |           |
| <b>Objectives</b>                       | Consolidation of the theoretical knowledge and understanding in the field of protistology, molecular ecology and functional genomics<br>Development of the abilities to the experimental work and understanding in the field of functional genomics and molecular ecology<br>Understanding of the principles in genome evolution and bioinformatics  |            |           |
| <b>Content of teaching</b>              | Consolidation of the theoretical knowledge and understanding in the field of protistology, molecular ecology and functional genomics.<br><i>The following topics will be discussed:</i> <ul style="list-style-type: none"> <li>• Molecular ecology: Approaches in the marine field</li> <li>• Evolution of protist and speciation processes</li> <li>• Introduction into the functional genomic</li> <li>• Application of functional genomics in the field of molecular ecology</li> <li>• Comparative genomics: Evolution of Polyketid Synthasen (PKS)</li> <li>• Introduction into Genome evolution</li> <li>• Genome annotation</li> <li>• Phylogenomics</li> </ul> <i>Methodologies applied in the laboratory part:</i> <ul style="list-style-type: none"> <li>• Extraction of RNA and DNA of marine protists: Analysis (NanoDrop, Bioanalyser)</li> <li>• Phylogenetic and populations genetic markers for protists (rDNA sequenzen, AFLP, microsatellites): Construction and evaluation</li> <li>• production of cDNA libraries the generation of ESTs</li> <li>• Gene expression analysis with real time PCR and microarrays</li> </ul> |            |           |
| <b>Educational objectives</b>           | <ul style="list-style-type: none"> <li>• Ability to apply learned methods in scientific projects</li> <li>• Capability to propose projects and experiments in the field of functional genomics and molecular ecology</li> <li>• Competence in the interpretation and transfer of scientific problems and concepts and the ability to present and discuss in an audience.</li> </ul>  |            |           |
| <b>Evaluation of learning progress</b>  | Seminar discussions<br>Potocols  |            |           |
| <b>Assessment</b>                       | Seminar presentation (30 %); protocol (30%); oral exam (40%)   |            |           |
| <b>Frequency</b>                        | Summer semester  |            |           |
| <b>Usage in other degree programmes</b> | M.Sc. Marine Biology   |            |           |
| <b>Premise</b>                          | Successful attendance in modules A and B   |            |           |